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AN EVALUATION OF 1961 CENSUS WAGE DATA FROM
CANVASSER-ENUMERATION AND SELF-ENUMERATION

by

David E. Gower
Economic Characteristics Section
Census Division, DBS

Working Paper (Demographic and Socio-economics Series) No. 3



Ottawa, March 1968.



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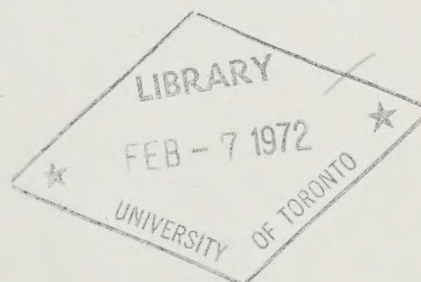
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AN EVALUATION OF 1961 CENSUS WAGE DATA FROM
CANVASSER-ENUMERATION AND SELF-ENUMERATION*

1. Introduction

The data used for this study was originally tabulated on the request of Miss J. Podoluk, Co-ordinator, Consumer Finance Research, DBS, and was turned over to the Economic Characteristics Section. Some very interesting findings arose upon examination of the data which reflect on the quality of the 1961 Census wages data and provide illumination on such issues as self-enumeration, computer assignments, non-response, and processing procedures.

In the 1961 Census there were two basic population enumeration documents: the form 2A, which was filled out by an enumerator for 100% of the population, (the labour force section was for all persons aged 15 and over) and the form 4 which was a partial self-enumeration form given to 20% of the non-farm non-institutional population over 14 years of age.

One question was duplicated on both forms: income from wages and salaries. Although the question wording differed slightly because of the different types of enumeration, the questions were intended to gather identical data. Question 25 on the 100% form 2A and question 6 on the 20% sample form 4 both asked for gross wages and salaries (before deductions). The form 2A, however, asked for wages in the past 12 months, whereas the form 4 allowed the respondent a choice between the previous 12 months and the calendar year 1960.

Computer printouts were provided for the 1,100,000 employees who were supposed to answer both questions. These printouts showed the responses to both questions cross-classified by occupation, sex, employment status and some other variables. It should be remembered that all data given in this study was weighted up to represent the whole non-farm, non-institutional adult Canadian labour force.

In the process of this project several large worksheets were drawn up. There are far too detailed to include here, so much of the data is present in summary form, and, in some cases, it is necessary to convey impressions and estimates gathered from these tables, unsupported by examples.

2. General Findings

2.1 Breakdowns

It was possible to compare, person by person, the form 2A (question 25, 100%, conventional enumeration) and the form 4 (question 6, 20%, self-enumeration)

* This study was assisted by M.B. Ismaili of the Economic Characteristics Section, who helped to organize the data and carry out some probing research. Credit should go to Dr. J. Fellegi, Director, Sampling and Survey Research, DBS, and to Mr. T.G. Beynon, Mrs. A. Kempster, and Mr. T.R. Sehdev of the Economic Characteristics Section, Census Division, DBS, for their advice and comments. Special recognition should also go to Miss J. Podoluk, Co-ordinator, Consumer Finance Research, for her many illuminating comments, of which a few are reproduced herein, and to Mr. O.R. Bierman, Graduate Assistant with this Section, who researched and wrote Appendix I.

results on a two-dimensional table for which the question 25 breakdown was:

| | |
|--------------|---------------|
| Not stated | |
| No wages | |
| 1- 499 | 4,500- 4,999 |
| 500- 999 | 5,000- 5,999 |
| 1,000- 1,499 | 6,000- 6,999 |
| 1,500- 1,999 | 7,000- 7,999 |
| 2,000- 2,499 | 8,000- 9,999 |
| 2,500- 2,999 | 10,000-11,999 |
| 3,000- 3,499 | 12,000-14,999 |
| 3,500- 3,999 | 15,000+ |
| 4,000- 4,499 | |

The breakdown of question 6 was the same with the omission of the "not stated" category. Hence a breakdown of question 6 response by question 25 response occupies a 19 x 18 matrix.

2.2 Overall results

76.8 per cent of persons including those reporting "no wages" reported in the same earnings category in both questions. This figure includes an undetermined number of persons who responded in 25 but failed to respond in 6 and had their question 25 amount assigned into question 6 by the computer.(1) It also includes some cases where the enumerator herself entered the amount in 6, using the answer from 25, before leaving the form with the respondent. In other words, 23.2% of persons reported in different categories under self-enumeration and conventional enumeration. The discrepancies tend to give males higher earnings in self-enumeration and females higher earnings in canvasser enumeration. The overall differences are as follows:

TABLE 2.1 Earnings of Wage-earners in Current Labour Force, 1961, Canada(1)

| | Mean earnings in 6 | Mean earnings in 25 |
|---------------|--------------------|---------------------|
| Males | \$3,894 | \$3,850 |
| Females | 1,995 | 2,024 |

(1) \$28,000 was used as a weight for the \$15,000+ class (See Appendix II.) These averages were calculated including "no wage" reporting.

The difference is small in both cases, being around 1%. It is only with smaller groups that these discrepancies can seriously affect the data.

2.3 Agreement by Size of Earnings Group

Sex-and-wage brackets can be arranged by whether agreement rates were low (under 75%), medium (75-79.9%) or high (80% or above). The earnings breakdowns specified are as reported in question 6. Thus, for example, by saying "1-499 males, 74.3%", it is meant that 74.3% of all males who reported in the \$1-499 bracket in question 6 reported in \$1-499 in question 25 as well.

(1) For the sake of brevity, the two questions will henceforth be referred to as 25 (100%, canvasser enumeration) and 6 (20%, self-enumeration).

TABLE 2.2 Wage-earners in Current Labour Force, 1961, by Percentage Agreement
Between Questions 6 and 25, by Earnings in 6

| Group A: low agreement | | Group B: medium agreement | | Group C: high agreement | |
|------------------------|-----------|---------------------------|------------|-------------------------|------------|
| Earnings in 6, sex | Agreement | Earnings in 6, sex | Agreement | Earnings in 6, sex | Agreement. |
| Per cent | | Per cent | | Per cent | |
| 15,000+ | F. 8.7 | 1,500-1,999 | M. 75.3 | 8,000-9,999 | M. 80.0 |
| No wages | M. 23.0 | 4,500-4,999 | M. 75.6 | 500-999 | F. 80.2 |
| 12,000-14,999 | F. 30.3 | 500-999 | M. 75.7 | 6,000-6,999 | M. 80.2 |
| No wages | F. 33.2 | 10,000-11,999 | M. 76.3 | 1,000-1,499 | F. 80.9 |
| 10,000-11,999 | F. 49.6 | 1,000-1,499 | M. 76.5 | 1,500-1,999 | F. 81.0 |
| 15,000+ | M. 65.8 | 2,500-2,999 | M. 77.6 | 2,500-2,999 | F. 81.1 |
| 12,000-14,999 | M. 70.6 | 7,000-7,999 | F. 77.7 | 3,500-3,999 | F. 81.2 |
| 1-499 | M. 74.3 | 2,000-2,499 | M. 77.9 | 4,000-4,499 | F. 82.6 |
| | | 7,000-7,999 | M. 77.9 | 3,000-3,499 | F. 82.6(1) |
| | | 8,000-9,999 | F. 78.2 | 5,000-5,999 | M. 82.9 |
| | | 1-499 | F. 78.5 | 6,000-6,999 | F. 83.4 |
| | | 4,500-4,999 | F. 78.5 | 2,000-2,499 | F. 83.7 |
| | | 3,500-3,999 | M. 78.6 | 5,000-5,999 | F. 84.5 |
| | | 3,000-3,400 | M. 78.9(1) | | |
| | | 4,000-4,499 | M. 79.7 | | |

(1) Adjusted for edits (See Chapter VI).

It can be seen from this table that the low rates of agreement are found in the extreme high and low classes. Two results, the "\$15,000+" and the "no wages", were so poor that they are the subject of special treatment in subsequent chapters.

Calculations from the worksheets, too complex to show here, indicate that although disagreement is high at both extremes, for both sexes the lower earnings groups show a slightly greater level of disagreement, but the difference is not large.

3. Agreement by Occupation

Enough variation is seen in the characteristics of different occupations to justify a separate chapter.

In the table below the occupation and sex brackets are shown by the overall percentage of agreement between the results of questions 25 and 6. The result is actually the weighted average of the percentages computed separately in a fashion analogous to table 1.2, done for each occupation. The table is divided into 3 groups: low agreement (under 75%), medium (75-79%) and high agreement (over 80%).

TABLE 3.1 Wage-earners in Current Labour Force, 1961, by Percentage Agreement
Between Questions 6 and 25, by Occupation

| Group A: low agreement | | Group B: medium agreement | | Group C: high agreement | |
|---------------------------------------|-----------|--|-----------|---|-----------|
| Occupation and sex | Agreement | Occupation and sex | Agreement | Occupation and sex | Agreement |
| | Per cent | | Per cent | | Per cent |
| Sales | M. 72.8 | Managers | M. 75.1 | Transportation and communication | F. 80.0 |
| Fishermen, trappers and hunters | M. 74.9 | Miners, quarrymen and related | M. 75.8 | Labourers | F. 81.0 |
| | | Clerical | M. 76.2 | Craftsmen | F. 81.1 |
| | | Professional and technical | M. 76.2 | Loggers and related workers | F. 81.1 |
| | | Managers | F. 76.4 | Loggers and related workers | M. 81.6 |
| | | Service and recreation | M. 76.7 | Farmers and farm workers | F. 82.5 |
| | | Transportation and communication | M. 76.9 | Miners, quarrymen and related workers | F. 90.6 |
| | | Craftsmen | M. 77.6 | Over all occupations: | |
| | | Farmers and farm workers | M. 77.8 | Females | 78.9 |
| | | Professional and technical | F. 77.9 | Males | 76.0 |
| | | Fishermen, trappers and hunters | F. 77.9 | | |
| | | Labourers | M. 78.2 | | |
| | | Clerical | F. 79.3 | | |
| | | Service and recreation | F. 79.5 | | |
| | | Sales | F. 79.7 | | |

It is interesting to note that the cluster of agreement rates for occupation is much closer than that exhibited for the earnings categories.

Some of the results of this table are surprising. That the male sales category should have the poorest agreement (72.8%) is not too surprising in view of the computational problems many of those persons face in determining their actual earnings. But, the fact that male miners and clerks should also be low on the list is puzzling, since we would expect for both fairly regularized payments, and for the latter a familiarity with record-keeping.

At the other end of the scale, the occupations with high rates of agreement seem to have no characteristics which explain the high agreement.(2)

In general, it can be said that the problem of inconsistency does not vary too radically between occupations.

4. Non-response

4.1 General

About 120,000 wage-earners (2% of total) failed to give their wages to the enumerator on Question 25 of the form 2A. Of these, about 60% (70,000) gave an answer on the self-enumeration form 4 to question 6. Unfortunately there is no record of how many non-responders to question 6 answered question 25 as in all such cases the amount for 25 was assigned by machine into question 6, and no record was kept of the number of times this was done.

However, it is possible to isolate the responses of the 70,000 persons who responded to 6 but not to 25.(3) These responses will give us a clue as to the amount of bias introduced into data by non-response: that is, they will indicate to us what the missing responses in 25 might have looked like had they been given. This will, as a by-product, help us to isolate the non-responders by earnings.

- (2) The thought occurs that perhaps for female farm workers the "no wages" category might be consistently reported. Unhappily, this is not true: the agreement rate for "no wages" in female farm workers is only 7.6%.
- (3) The method by which this is done is discussed in chapter 7.

TABLE 4.1 Responses in 6 of Non-Responders in 25, Wage-earners in Current Labour Force, Canada, 1961

| Response in 6 | Sex | | | | Total | |
|------------------------------|---------|-------|---------|-------|-----------|-------|
| | Male | | Female | | | |
| | Number | % | Number | % | Number | % |
| No response | 34,130 | 41.0 | 13,914 | 42.7 | 48,044(1) | 41.4 |
| No wages | 15,964 | 19.2 | 7,377 | 22.6 | 23,341 | 20.1 |
| 1- 499 | 2,560 | 3.1 | 2,995 | 9.2 | 5,555 | 4.8 |
| 500- 999 | 2,055 | 2.5 | 1,385 | 4.2 | 3,440 | 3.0 |
| 1,000- 1,499 | 2,128 | 2.6 | 1,144 | 3.5 | 3,272 | 2.8 |
| 1,500- 1,999 | 1,933 | 2.3 | 1,171 | 3.6 | 3,104 | 2.7 |
| 2,000- 2,499 | 2,362 | 2.8 | 1,321 | 4.0 | 3,683 | 3.2 |
| 2,500- 2,999 | 2,386 | 2.9 | 1,016 | 3.1 | 3,202 | 2.9 |
| 3,000- 3,499 | 2,510 | 3.0 | 787 | 2.4 | 3,297 | 2.8 |
| 3,500- 3,999 | 2,833 | 3.4 | 558 | 1.7 | 3,391 | 2.9 |
| 4,000- 4,499 | 3,173 | 3.8 | 396 | 1.2 | 3,569 | 3.1 |
| 4,500- 4,999 | 2,027 | 2.4 | 229 | 0.7 | 2,256 | 1.9 |
| 5,000- 5,999 | 3,136 | 3.8 | 145 | 0.4 | 3,281 | 2.8 |
| 6,000- 6,999 | 1,887 | 2.3 | 67 | 0.2 | 1,954 | 1.7 |
| 7,000- 7,999 | 1,145 | 1.4 | 34 | 0.1 | 1,179 | 1.0 |
| 8,000- 9,999 | 1,114 | 1.3 | 19 | 0.1 | 1,133 | 1.0 |
| 10,000-11,999 | 695 | 0.8 | 10 | 0.0 | 705 | 0.6 |
| 12,000-14,999 | 558 | 0.7 | 10 | 0.0 | 568 | 0.5 |
| 15,000+ | 696 | 0.8 | 14 | 0.0 | 710 | 0.6 |
| Total | 83,293 | 100.0 | 32,592 | 100.0 | 115,885 | 100.0 |
| Average of above(2) | \$2,946 | | \$1,118 | | \$2,441 | |
| Average of all w.-e.'s(3) .. | \$4,000 | | \$2,020 | | \$3,400 | |

(1) "No response" 48,044 in 6 are the estimated number of persons assigned \$3,300 (See Chapter 6).

(2) Average excludes "No response".

(3) Taken from form 4, not form 2B results. Estimated.

The average earnings exhibited in 6 of non-responders to 25 is substantially below the overall average earnings. One would need to know, of course, such characteristics of the non-responders as age, schooling, weeks and hours worked, etc., to gain greater insight into the precise casual factors of the lower amounts.

The next step is to see if this pattern holds across the various occupations.

TABLE 4.2 Average Earnings (as shown in 6) of Non-Responders to 25, Wage Earners in the Current Labour Force, Canada, 1961

| Occupation | | Average earnings of non-responders to 25 | Average earnings of all persons | Difference |
|----------------------------------|----|---|---------------------------------------|------------|
| Managers | M. | 7,628 | 7,276 | - 352 |
| | F. | 2,675 | 3,315 | 640 |
| Professional and technical | M. | 5,060 | 5,695 | 635 |
| | F. | 1,892 | 3,120 | 1,228 |
| Clerical | M. | 3,019 | 3,500 | 481 |
| | F. | 1,724 | 2,353 | 629 |
| Sales | M. | 4,221 | 4,120 | - 101 |
| | F. | 886 | 1,372 | 486 |
| Service and recreation | M. | 2,373 | 3,300 | 927 |
| | F. | 436 | 1,200 | 764 |
| Transportation and communication | M. | 2,834 | 3,620 | 786 |
| | F. | 1,863 | 2,147 | 284 |
| Farmers and farm workers | M. | 1,050 | 1,401 | 351 |
| | F. | 236 | 607 | 371 |
| Loggers and related | M. | 1,715 | 2,210 | 495 |
| | F. | (1) | (1) | (1) |
| Fishermen, trappers, etc. | M. | 1,587 | 1,850 | 263 |
| | F. | (1) | (1) | (1) |
| Miners, etc. | M. | 3,227 | 4,195 | 968 |
| | F. | (1) | (1) | (1) |
| Craftsmen | M. | 2,936 | 3,735 | 799 |
| | F. | 1,252 | 1,830 | 578 |
| Labourers | M. | 1,319 | 2,300 | 981 |
| | F. | 960 | 1,519 | 559 |
| Occupation not stated | M. | 896 | 3,700 | 2,804 |
| | F. | 613 | 2,100 | 1,487 |

(1) Figure not applicable. No "not stated" in match.

We see that in two occupation-sex categories, male managers and male salesmen, non-response tends to be prevalent more among high-earnings persons than low-earnings persons. In all other categories the opposite occurs, the largest absolute differences being found in female professional and technical, male service

and recreation, male miners, male labourers and occupation not stated(4) of both sexes. One suspects from seeing some of these latter groups that part-time work (female professionals and male labourers) causes part of the non-response problems, which in turn indicates a computational difficulty among low-earnings persons faced with conventional enumeration and a problem of quick recall.

The two cases where non-responders had higher incomes than responders, managers and sales, male, are expected, since here we see the persons with higher earnings being those with greater fuzziness of their actual earnings (i.e., a mixture of commissions, special fees, expense accounts, stock options, and other odd sources which go to make up wages and salaries) which makes it difficult to reply to the enumerator (and possibly also a little uncomfortable) but easier to reply when given the opportunity to sit down with paper and pencil over a self-enumeration form.(5)

4.2 The Other Side of the Coin

We can also learn something about non-responders by investigating, in conjunction with the data given in tables 4.1 and 4.2, the rate of response to 6 of non-responders to 25 by occupation.

- (4) The extremely great difference in the "occupation not stated" category tells us something about the nature of the "hard core" non-responders: they are low-earnings persons relative to the partial non-responders (those who replied to earnings but not occupation).
- (5) Miss J. Podoluk, Co-ordinator, Consumer Finance Research, DBS, has commented to the author: "In case of the managers and salesmen the reasons for non-response might be either (a) husbands may not have been at home and wives less likely to know income if it is higher than if it is some "average" figure or (b) reluctance to supply information to enumerator but willingness to answer on a confidential basis. On our surveys we had a mail follow up for persons not willing to return questionnaires directly to enumerator. We have found that the mail follow up tends to be overrepresentative of "above average" earnings."

TABLE 4.3 Percentage of Non-Responders to 25 who Responded to 6, Wage Earners in Current Labour Force, Canada, 1961

| Occupation | Sex | | Total |
|--|------|--------|-------|
| | Male | Female | |
| Manager | 82.3 | 76.7 | 81.8 |
| Professional and technical | 78.0 | 74.7 | 76.8 |
| Clerical | 82.5 | 81.7 | 82.0 |
| Sales | 83.6 | 84.4 | 83.8 |
| Service and recreation | 73.4 | 78.6 | 76.7 |
| Transportation and communication | 79.4 | 72.6 | 78.8 |
| Farmers and farm labourers | 75.0 | 79.1 | 75.3 |
| Loggers and related workers | 71.2 | (1) | 71.2 |
| Fishermen, trappers and hunters | 82.8 | (1) | 82.8 |
| Miners, etc. | 84.8 | (1) | 84.8 |
| Craftsmen | 80.6 | 81.6 | 80.7 |
| Labourers | 79.6 | 81.6 | 79.7 |
| Occupation not stated(2) | 32.5 | 18.6 | 29.1 |
| Total occupation | 58.8 | - 57.3 | 58.4 |

(1) Not applicable. No persons in category.

(2) The results of the "occupation not stated" group show that for those who would not answer or could not be found for conventional enumeration, the rate of success in getting a self-enumeration response was very low. The lower rate for females probably indicates a lack of wages rather than less cooperation.

To put the analysis on a more rigorous footing, let us formulate 4 testable hypotheses to explain why non-response to wage questions occurs:

- (a) people fail to respond because they are against disclosing their earnings to other persons as a matter of principle, or because they avoid the entire enumeration procedure, either from lack of desire to co-operate or ignorance of its existence;
- (b) people have difficulty in calculating their earnings;
- (c) people don't want to reveal their earnings for fear of disclosing income tax evasion;
- (d) people don't mind revealing their earnings to an impersonal government, but they are reluctant or unable to tell an enumerator.

In order to test these hypotheses, we formulate the following implications:

- (a) if hypothesis (a) is true, we would expect people who failed to respond in 25 would also fail to respond in 6;
- (b) if (b) is true, then we would expect that the failure to respond to 6 will be higher in occupations not characterized by high education or training in systematic recordkeeping;
- (c) if (c) is true, then we would expect to see persons with high earnings and higher tax rates particularly unwilling to give their earnings to either self-enumeration or an enumerator;
- (d) if (d) is true, then we would expect most of the non-responders to 25 to respond to 6, with the possible exception of the "hard core" of generally unco-operative persons.

The data given on the response to 6 of the non-responders to 25 does not tell us much by itself unless we can be sure that the opposite result, e.g., a high response rate to 25 of non-responders to 6, did not also occur. However, the author suspects that since for most of the cases where the occupation was given, around 80% of the non-responders to 25 replied to 6, that the people who are basically co-operative (and showed it by replying to occupation) prefer to report wages in self-enumeration rather than in canvasser enumeration, and that the opposite response pattern would probably not occur.(6)

This said, we now draw our conclusions about the validity of behavior hypotheses (a) to (d) above from our data.

- (i) Hypothesis (a) appears to apply only to the "hard core" of non-responders, i.e., those who cannot be located for enumeration or who refuse to cooperate (e.g., boarding house lodgers). This is shown by the fact in table 3.3 that the "occupation not stated" persons who also failed to reply in 25 had a very low response rate in 6. For others, e.g., the "partial non-responders", hypothesis (a) does not seem to apply, since 80% of the persons who gave an occupation but did not respond to wages in question 25, replied on the self-enumeration form, thus showing that they do not generally object to giving wage data on principle.
 - (ii) Hypothesis (b) does not seem to be supported. Selecting two cases for illustration, clerical males actually have a lower response rate in table 3.3 than male miners.
- (6) Miss Podoluk comments: "The reasons why Question 6 was more successful may have been the difficulty of reaching people via conventional enumeration. Question 25 was asked in ranges and there may have been a recall problem when the question had to be produced. It is possible that if the enumerator had been prepared to call back for the answer it would have been supplied to Question 25 as readily as to Question 6".

- (iii) Hypothesis (c), that fear of income tax evasion is a cause of non-response, is not supported. Managers and salesmen, the two groups of non-responders with probably the largest scope for tax evasion, both showed themselves in table 4.3 as willing to reply on the self-enumeration form as the non-responders to question 25 in most other occupations.
- (iv) Hypothesis (d), that people are reluctant to tell their wages to an enumerator but willing to report them on self-enumeration, seems to be supported for that segment of the population which can be called "somewhat co-operative", i.e., who replied to the occupation question.(7) This finding is clouded by the possibility that some of the non-response to earnings may be due to second-person response to the enumerator, e.g., the wife knows her husband's occupation but not his wages, and the husband answers wages on form 4.

From the results of these 4 sections above we can conclude that the non-response problem to wages is characterized as follows:

- (a) there is a "hard core" (estimated from the worksheets at 38,000 wage-earners, or 1% of total, in 1961) who are unresponsive or unavailable to the whole enumeration process(8) and
- (b) for others (estimated at 77,000 or 2% of total wage-earners in 1961) the problem appears to be generally not refusal on principle, but rather an unwillingness or inability to tell an enumerator what the wages are; a situation that can be overcome by self-enumeration.

5. "No Wages" Response

5.1 General

As stated in Chapter 1, the category "no wages" is one of very small agreement between questions 6 and 25.

- (7) Miss Podoluk doubts the significance of this result, saying: "On our surveys we use self-enumeration for the straight income surveys and enumerators for the income, asset and debt surveys. On the latter we insist that enumerators make appointments and conduct interviews only with persons who are knowledgeable about the questions. Given these stipulations we have not found a preference among households for self-enumeration as contrasted to enumerator probing. In fact the 1964 survey which asked about all aspects of financial affairs had a higher response rate than the 1966 survey which used self-enumeration. Further, the income questions appear to be as well answered on one survey as on the other. Another point is that Question 6 accepted calendar year data for which records could be consulted. Question 25 wanted the previous twelve months which is much harder to answer."
- (8) Non-response to both occupation and wages must be used for a proxy for total non-response, since this is the limit of the available data in this study.

TABLE 5.1 "No Wages" Responders in 25 by Response in 6, Wage-Earners
in Current Labour Force, Canada, 1961

| Response in Question 6 | Sex | | Total |
|------------------------|--------|--------|--------|
| | Male | Female | |
| No wages | 24,639 | 17,222 | 41,861 |
| 1- 499 | 10,356 | 14,845 | 25,201 |
| 500- 999 | 2,191 | 1,292 | 3,483 |
| 1,000- 1,499 | 4,426 | 553 | 4,979 |
| 1,500- 1,999 | 778 | 707 | 1,485 |
| 2,000- 2,499 | 882 | 608 | 1,490 |
| 2,500- 2,999 | 650 | 495 | 1,145 |
| 3,000- 3,499 | 971 | 353 | 1,324 |
| 3,500- 3,999 | 581 | 175 | 756 |
| 4,000- 4,499 | 566 | 112 | 678 |
| 4,500- 4,999 | 345 | 37 | 382 |
| 5,000- 5,999 | 501 | 58 | 559 |
| 6,000- 6,999 | 338 | 38 | 376 |
| 7,000- 7,999 | 210 | 30 | 240 |
| 8,000- 9,999 | 231 | 19 | 250 |
| 10,000-11,999 | 106 | 10 | 116 |
| 12,000-14,999 | 92 | - | 92 |
| 15,000+ | 197 | - | 197 |
| Total | 45,060 | 36,554 | 81,614 |

Two factors must be remembered in reading table 5.1. First, the question 25 only took amounts to the nearest \$100, thus any amount less than \$50 was coded to "No wages" in 25, even though it would have been legitimately reported in the \$1-499 bracket in question 6. Secondly, a "No wage" response in 6 can have two meanings: "No wages" were actually reported by the person in question 6, or the question 6 was blank and the "No wages" response in 25 was transferred in by computer.

Even these cases, however, where the person replied "No wages" in both questions are somewhat ambiguous. Undoubtedly some are legitimate. There is evidence, however, that some "No wage" responses are actually a form of refusal. What the person is in effect saying is that "I refuse to report any wages".

In analysing table 5.1 further, we adopt the following convention: since, as mentioned, above an entry of "No wages" in 25 and "\$1-499" in 6 could be correct, we shall only take the entries in categories \$500-999 and above as "obviously inconsistent".(9) In calculating the percentage of persons with "obviously inconsistent" answers, we must remember that this is probably an understatement of the number of "actually" inconsistent cases.

(9) The author may be operating on thin ice here, as there are two possible explanations for an apparently inconsistent entry: the change in the time reference period (see Introduction) or a confusion in the class of worker.

TABLE 5.2 Percentage of Persons Reporting "No Wages" in Question 25 With "Obviously Inconsistent" Answers in Question 6, by Occupation, Wage-Earners in the Current Labour Force, Canada, 1961

| Occupation | Sex | |
|--|------|--------|
| | Male | Female |
| Managers | 61.6 | 34.6 |
| Professional and technical | 52.1 | 28.2 |
| Clerical | 27.3 | 13.9 |
| Sales | 37.8 | 13.3 |
| Service and recreation | 22.2 | 13.8 |
| Transportation and communication | 35.9 | 22.2 |
| Farmers and farm workers | 29.8 | 23.2 |
| Loggers and related | 31.6 | (1) |
| Fishermen, trappers and hunters | 25.3 | (1) |
| Miners, quarrymen, etc. | 29.2 | (1) |
| Craftsmen | 32.2 | 15.3 |
| Labourers | 19.7 | 18.4 |
| Occupation not stated | 12.1 | 5.8 |
| Total occupation | 22.3 | 12.2 |

(1) Not applicable. No persons reporting "No wages".

We find some rather surprising results when we break it down by occupation.

Male managers and male professionals, both highly paid groups, had over 1/2 "obviously inconsistent" entries. As one drops down the average earnings scale so does the rate of inconsistency drop: to less than 20% in such low-pay categories as female sales and clerical.(10) We can thus establish a correlation between earnings and the rate of inconsistency.(11)

This correlation indicates that "No wages" is being used by some persons to avoid responding to the enumerator (or by the enumerator to avoid a non-response), and that this use grows with earnings.

(10) "Occupation not stated" does not fit into this pattern. But the high agreement is probably due to machine assignments of blank 6 answers, so the figure is too low.

(11) Rank correlation coefficient of .678, significant at 95%.

5.2 Averages

Average wages, for the "obviously inconsistent" persons were calculated by occupation.

TABLE 5.3 Average Wages of the "Obviously Inconsistent" Persons, as Calculated from 6, by Occupations, Wage-Earners in the Current Labour Force, Canada, 1961

| Occupation | Sex | |
|--|-------|--------|
| | Male | Female |
| Managers | 6,978 | 3,330 |
| Professional and technical | 5,271 | 2,284 |
| Clerical | 2,317 | 2,153 |
| Sales | 4,583 | 1,702 |
| Service and recreation | 2,425 | 1,680 |
| Transportation and communication | 3,208 | 1,639 |
| Farmers and farm workers | 1,954 | 2,292 |
| Loggers and related | 2,559 | (1) |
| Fishermen, trappers, etc. | 1,976 | (1) |
| Miners, quarrymen, etc. | 1,960 | (1) |
| Craftsmen | 3,065 | 1,732 |
| Labourers | 1,943 | 2,755 |

(1) Not applicable. No persons in this category.

The interesting thing is that, with a couple of exceptions,(12) the average earnings of these persons do not differ too radically from the overall results for the occupation.

This indicates that the "obviously inconsistent" reporters are a fair representation of the occupations as a whole, and not the domain of particular segments of the labour force.

(12) The exceptions; farmers, female, and labourers, female, have small numbers and therefore have sampling error. It is also possible that some of the persons with "obviously inconsistent" entries are members of religious orders for whom the enumerator assumed "no wages", but who reported on self-enumeration wages paid to their order. In addition, computer edits may have caused some error, both by changing class of worker and by accepting "no wages" over an amount if both were marked.

6. The Ten-to-One Mystery

The strangest result from the match was the finding of a mysterious 10 to 1 bias among a small number of responders. The exact number of such cases is impossible to determine, but is probably in the range of 5,000 to 15,000.(13) The odd thing about these cases is that they occur mainly one way — the self-enumeration response (6) is 10 times the canvasser response (25).(14) This occurs for both sexes.

To illustrate how this strange situation manifests itself, let us choose as an example all these persons reporting 15,000+ wages in question 6.

TABLE 6.1 Persons Reporting 15,000+ in Question 6 by the Response to 25, Wage-Earners in the Current Labour Force, Canada, 1961

| Response in 25 | Sex | |
|---------------------|--------|--------|
| | Male | Female |
| Not stated | 696 | 14 |
| No wages | 197 | — |
| 1- 499 | 65 | 11 |
| 500- 999 | 60 | 26 |
| 1,000- 1,499 | 61 | 21 |
| 1,500- 1,999 | 409 | 256 |
| 2,000- 2,499 | 430 | 178 |
| 2,500- 2,999 | 484 | 122 |
| 3,000- 3,499 | 686 | 60 |
| 3,500- 3,999 | 479 | 28 |
| 4,000- 4,499 | 457 | 21 |
| 4,500- 4,999 | 295 | 5 |
| 5,000- 5,999 | 328 | 10 |
| 6,000- 6,999 | 173 | — |
| 7,000- 7,999 | 167 | 5 |
| 8,000- 9,999 | 258 | — |
| 10,000-11,999 | 915 | 6 |
| 12,000-14,999 | 1,803 | 5 |
| 15,000+ | 15,352 | 74 |
| Total | 18,462 | 842 |

The pattern shows the phenomenon quite clearly: small numbers are reported up to the 1,500-1,999 class in question 25. Then a dramatic jump occurs.(15) 1,500, (the lower interval of this 1,500-1,999 category), x 10 is, of course, 15,000, which is the beginning point of the class of 6 reporting for which these people are concerned. The 2,000-2,499, 3,000-3,499 and higher classes also yield 15,000+ if multiplied by 10, and they too contain a larger number of persons.

(13) A rough estimate is available because this phenomenon causes anomalies on the work-sheets.

(14) The opposite case occurs somewhere around 200-500 times.

(15) This dramatic jump is not shown in other question 6 categories (e.g., \$1-499, \$500-999) at this point. It is a clear anomaly.

TABLE 6.2 Persons Reporting 15,000+ in Question 25 by Response to 6, Wage-Earners in Current Labour Force, Canada, 1961

| Response in Question 6 | Sex | |
|------------------------|--------|--------|
| | Male | Female |
| No wages | 882 | 19 |
| 1- 499 | 72 | -- |
| 500- 999 | -- | -- |
| 1,000- 1,499 | 40 | -- |
| 1,500- 1,999 | 61 | -- |
| 2,000- 2,499 | 45 | -- |
| 2,500- 2,999 | 10 | -- |
| 3,000- 3,499 | 30 | -- |
| 3,500- 3,999 | 36 | 10 |
| 4,000- 4,499 | 68 | -- |
| 4,500- 4,999 | 24 | -- |
| 5,000- 5,999 | 83 | -- |
| 6,000- 6,999 | 82 | -- |
| 7,000- 7,999 | 54 | -- |
| 8,000- 9,999 | 89 | -- |
| 10,000-11,999 | 336 | 5 |
| 12,000-14,999 | 1,198 | -- |
| 15,000+ | 15,352 | 74 |
| Total | 18,462 | 108 |

If one examines for other 10 x 1 biases, such as between 500 and 5,000, and between 1,000 and 10,000, precisely the same result occurs. The bias is definitely there.

In an attempt to determine the source of the bias (machine edit, key-punching, etc.) section records were used to locate 25 persons with a 10-to-1 error. Their form 4 and form 2A documents were examined in the original (a few form 4's have been kept, and the 1961 2A documents are on microfilm). The surprising result: in 25 of the 25 cases the confusion is at the respondent stage. The amounts were actually given that way on the forms.

This phenomenon has had considerable effect on the 1961 wages data. For example, it can be seen on tables 6.1 and 6.2 that question 25 showed 108 females with 15,000+ wages: question 6, 842.

There is no question which was correct source. The form 4, self-enumeration, document was wrong. This is easy to see from tables 6.1 and 6.2. If form 2A were wrong, then this would mean that the distribution of persons 15,000+ would be as follows:

TABLE 5.3 Hypothetical Distributions of Income, Assuming Correct Form 4 Reporting(1)

| | Male | Female |
|---------------------|------|--------|
| 15,000-19,999 | 342 | 233 |
| 20,000-24,999 | 351 | 158 |
| 25,000-29,999 | 393 | 105 |
| 30,000-34,999 | 583 | 46 |
| 35,000-39,999 | 364 | 17 |
| 40,000-44,999 | 330 | 13 |
| 45,000-49,999 | 156 | — |
| 50,000-59,999 | 177 | — |

(1) This table is constructed in the following manner: the number of 10-to-1 cases is estimated by superimposing a "normal" profile (a linear projection upward from the \$1,000-1,499 class) and observing the degree by which the actual class frequency exceeds the "normal" in table 5.1. These excess amounts are then assigned to a class 10 times the original size e.g. the \$1,500-\$1,999 becomes \$15,000-\$19,999.

Anyone familiar with the shape of upper-income tails knows that a larger quantity for males in the 35,000-39,999 category than in the 15,000-19,999 category is most unlikely. Rather the above profile has precisely the shape of conventional 1961 profiles in the \$1,500-6,000 range, i.e., a mode around \$3,300 for males, and around \$2,000 for females. Thus the conclusion that the canvasser enumeration produced better results in this matter is inevitable.

7. Other Findings

7.1 Assignment Error for Blanks

It would seem necessary to put on record that a mistake was made in processing the question 6 responses in 1961. This was discovered during the course of the match. It affected about 48,000 wage-earners.

The blame for this is of no concern at this late date, but it should be stated that the instructions from the subject-matter statisticians were not followed.

What happened was that in cases where 6 was blank and a 25 answer was not available for substitution, the intended procedure (a last record assignment) was not used. Rather an arbitrary amount of \$3,300 was assigned for every person regardless of sex or occupation.

Generally this does not appear to have dramatically affected the data since it affected only 1% of the wage-earners. In at least one case, however, (wages of "occupation not stated" persons) distortion is quite evident.(16) Ironically, this error allowed us to isolate these assignments, which would not have otherwise been possible by the last-record routine.

(16) See 1961 Census, vol. 4.1-2, B4-19, line 63.

All data presented in this paper have been adjusted for this distortion wherever it seemed necessary.

7.2 Differences Between "Current" and "Annual" labour Force

The overall consistency findings were compared between the current labour force (those who worked or looked for work in the past week) and those not in the current labour force but who worked in the 12 months prior to the Census. The patterns of the two groups seem to be essentially the same.

8. Summary and Implications

8.1 Summary of Findings

1. The average earnings of all wage-earners as reported by self-enumeration is almost precisely the same as that reported by canvasser enumeration. The difference is around 1%.
2. Discrepancies in reporting tend to occur more at the extreme upper and lower ends of the earnings scale, whereas persons of average earnings tended to give the same amounts in both forms of enumeration.
3. The pattern shown in 2. above is similar across all occupation divisions by sex.
4. The consistency of reporting in occupations is fairly constant: that is, no occupations show up as "problem occupations" from the point of view of consistency.
5. Overall, 77% of persons reported consistently in both forms of enumeration.
6. 60% of persons who failed to give wages to the canvasser enumeration gave an answer to the self-enumeration wages question. If the "hard core" of persons who failed to respond to other questions is omitted, the figure rises to 80%.
7. Non-responders appear to be generally lower-income persons than responders. This is true for all occupation-sex categories except male managers and salesmen.
8. Reasons for non-response to wages of people not in the "hard core" appear to be a lack of willingness or ability to reply to an enumerator. There appears to be less difficulty on a self-enumeration form.
9. There was a poor agreement in the "no wages" category between the two forms of enumeration. This is possibly due at least in part to enumeration procedures. It is probably due to a habit of using "no wages" as a refusal on enumeration. The tendency to make this use appears to rise as wages rise. The earnings of persons making this use are in general not too different from the overall wage-earner population.
10. There was a tendency for people to misreport their earnings in self-enumeration, raising them by a factor of 10. This occurred between 5,000 and 15,000 times. It was not matched by a similar tendency in canvasser enumeration.
11. Some 1961 income data were distorted by a mistake in the computer assignments.

8.2 Implications

The results of this study do not allow us to say conclusively that one form of enumeration is better than the other. From the point of view of wage data, self-enumeration appears to gather more data. However, this does not necessarily mean better data.

It should be remembered that self-enumeration was still in its infancy in 1961. Since then it has been tested and, it is to be hoped, somewhat refined as a Census operation. It is hoped that in 1971, if self-enumeration is adopted it will be possible to avoid many of the possible pitfalls shown in 1961.

At least one other major factor remains to be considered: in 1961 two documents were given. In many cases the enumerator physically entered the wages on the form 4 before leaving it. In any event, the respondent had an opportunity to recall his earlier response. Thus an artificial element is imposed into the comparison. In 1971 the person will be given only one form, and the problems may be different.

APPENDIX A

An Examination of the Consistency of Response for Class of Worker
and Source of Income

In the 1961 Census two major documents were employed for enumeration. One was Form 2A, a 100 per cent canvasser enumeration document from which class of worker was determined. The two larger divisions were self-employed and wage and salary earner. The other form, Form 4, was a self-enumeration document to be filled out by a 20% sample of the population of over 14 years of age living in private non-farm dwellings. It gathered information on the source and amount of income as well as on fertility and migration. For the purposes of this study the relevant datum was the source of income. In this paper only wages and salary and self-employment income shall be included as income. Question six on Form 4 inquired about the receipt of wages and salary, and question seven asked for earnings from self-employment.

The data from Form 2A and Form 4 were matched, and the consistency of the responses to class of worker on 2A and source of income on 4 was studied.

Tables 1 and 2 show the consistency for wage and salary earners by occupations and industries.

TABLE 1. Wage and Salary Earners by Occupation by Response on Form 4

| | Total | 6 only | 6+7, 6LT7 | 6+7, 6GT7 | 7 only |
|---|-----------|-----------------|-------------|-------------|--------------|
| Managerial | 282,262 | 268,490(95.1) | 1,359(0.5) | 6,722(2.4) | 5,691(2.0) |
| Professional and technical | 518,056 | 487,215(94.0) | 1,896(0.4) | 14,753(2.9) | 14,192(2.7) |
| Clerical | 892,181 | 872,320(97.8) | 1,436(0.2) | 7,458(0.8) | 10,967(1.2) |
| Sales | 420,194 | 403,807(96.1) | 1,723(0.4) | 5,895(1.4) | 8,769(2.1) |
| Service and recreation | 701,582 | 676,238(96.4) | 2,599(0.4) | 7,323(1.0) | 15,422(2.2) |
| Transport and communications | 370,807 | 355,406(95.8) | 1,663(0.5) | 5,439(1.5) | 8,299(2.2) |
| Farmers and farm workers | 76,344 | 72,218(94.6) | 710(0.9) | 1,216(1.6) | 2,200(2.9) |
| Loggers and related workers | 70,884 | 66,117(93.3) | 739(1.0) | 1,698(2.4) | 2,330(3.3) |
| Fishermen, trappers and hunters | 13,065 | 10,744(82.2) | 996(7.6) | 503(3.9) | 822(6.3) |
| Mines, quarrymen and related workers | 62,666 | 60,275(96.2) | 501(0.8) | 849(1.3) | 1,041(1.7) |
| Craftsmen, production process and related workers | 1,509,642 | 1,440,609(95.4) | 4,718(0.3) | 33,536(2.2) | 30,782(2.0) |
| Labourers not elsewhere classified ... | 321,297 | 308,201(95.9) | 1,920(0.6) | 4,147(1.3) | 7,029(2.2) |
| Occupation not stated | 87,664 | 83,008(94.7) | 715(0.8) | 1,899(2.2) | 2,042(2.3) |
| Total | 5,326,647 | 5,104,648(95.8) | 20,075(0.4) | 91,438(1.7) | 109,586(2.1) |

TABLE 2. Wage and Salary Earners by Industry by Response to Form 4

| | Total | 6 only | 6+7, 6LT7 | 6+7, 6GT7 | 7 only |
|---|-----------|-----------------|-------------|-------------|--------------|
| Agriculture | 65,577 | 61,702(94.1) | 658(1.0) | 1,222(1.9) | 1,995(3.0) |
| Forestry | 97,758 | 91,339(93.4) | 978(1.0) | 2,347(2.4) | 3,094(3.2) |
| Fishing and trapping | 12,855 | 10,843(84.3) | 876(6.8) | 457(3.6) | 679(5.3) |
| Mines, quarries and oil wells | 119,502 | 114,805(96.1) | 620(0.5) | 2,030(1.7) | 2,047(1.7) |
| Manufacturing | 1,411,056 | 1,358,569(96.3) | 3,367(0.2) | 23,482(1.7) | 25,638(1.8) |
| Construction | 359,168 | 339,440(94.5) | 2,184(0.6) | 8,197(2.3) | 9,347(2.6) |
| Transportation communication and other Utilities | 589,811 | 566,986(96.1) | 2,140(0.4) | 10,474(1.8) | 10,211(1.7) |
| Trade | 882,470 | 851,046(96.5) | 2,948(0.3) | 11,667(1.3) | 16,809(1.9) |
| Finance, insurance and real estate ... | 221,730 | 214,477(96.7) | 679(0.3) | 3,292(1.5) | 3,282(1.5) |
| Community, business and personal service | 1,034,703 | 983,632(95.1) | 4,388(0.4) | 18,397(1.8) | 28,286(2.7) |
| Public administration and defence | 451,803 | 435,819(96.5) | 1,449(0.3) | 8,190(1.8) | 6,345(1.4) |
| Unspecified or undefined | 80,214 | 75,990(94.7) | 688(0.9) | 1,683(2.1) | 1,853(2.3) |
| Total | 5,326,647 | 5,104,648(95.8) | 20,975(0.4) | 91,438(1.7) | 109,568(2.1) |

Fully 95.8% of the wage earners reported wages and salary as their only source of income on the self-enumeration Form 4. This is as high as one could expect since for some people the data on income was collected for the previous calendar year, and there was the probability that some of the wage earners had switched from self-employment during the intervening months.

On further examination of individual groups of occupations and industries, it was found that, with the exception of one industry group and one occupation group, the percentage consistency between wage earners and those reporting only wage and salary income was spread within the narrow range of 93.3% to 97.8%; quite high, considering that an average of a further 2.1% indicated that part of their income was derived from wages and salary.

The industry division with a lower percentage reporting wage earner status and having wages and salary as a sole source of income was fishing and trapping. Only 84.3% entered self-employment income as their only source of income. Similarly the occupation division which had a relatively lower percentage of wage earners reporting wages and salary as their sole source of income was fishermen, trappers and hunters. The percentage of this occupation division classified as wage earners and reporting wages and salary as their sole source of income was 82.2%. In this case 6.3% reported self-employment income as their only source of income. In this occupation and in this industry one would expect that there is a great deal of mobility between wage earner status and self-employment, depending on seasonal and cyclical factors. Thus one could anticipate that the class of worker obtained with reference to the census week may lead to a relatively large proportion of people being put in a class to which they did not belong during the twelve months for which the income data was collected on Form 4.(17)

For those who were classified as self-employed, the discrepancy between employment status and source of income was much more marked. For the aggregate total, fully 30.7% of the self-employed reported wages and salary as their sole source of income.

(17) Mrs. A.J. Kempster, Chief, Economic Characteristics Section, has suggested that many fishermen work on boats on a "share" basis, and that such income might be reported as self-employment income, although the person would be reported as a wage-earner.

TABLE 3. Self-employed by Occupation by Response to Form 4

| | Total | 6 only | 6+7, 6LT7 | 6+7, 6GT7 | 7 only |
|---|---------|---------------|-------------|-------------|---------------|
| Managerial | 237,807 | 74,240(31.2) | 10,014(4.2) | 15,659(6.6) | 137,894(58.0) |
| Professional and technical | 54,819 | 8,291(15.1) | 2,817(5.2) | 4,399(8.0) | 39,312(71.7) |
| Clerical | 2,332 | 957(41.0) | 114(4.9) | 113(4.9) | 1,148(49.2) |
| Sales | 16,781 | 7,110(42.4) | 554(3.3) | 1,223(7.3) | 7,894(47.0) |
| Service and recreation | 37,479 | 12,132(32.4) | 989(2.6) | 2,310(6.2) | 22,048(58.8) |
| Transport and communications | 28,659 | 9,159(32.0) | 1,355(4.7) | 2,068(7.2) | 16,077(56.1) |
| Farmer and farm workers | 23,793 | 9,547(40.1) | 1,579(6.6) | 1,464(6.2) | 11,203(47.1) |
| Loggers and related workers | 4,450 | 1,672(37.6) | 386(8.7) | 386(8.7) | 2,006(45.0) |
| Fishermen, trappers and hunters | 30,242 | 10,058(33.3) | 3,672(12.1) | 1,944(6.4) | 14,568(48.2) |
| Miners, quarrymen and related workers | 837 | 293(35.0) | 25(3.0) | 36(4.3) | 483(57.7) |
| Craftsmen, production process and related workers | 84,236 | 26,184(31.1) | 2,834(3.4) | 5,669(6.7) | 49,589(58.8) |
| Labourers not elsewhere classified ... | 1,347 | 701(52.0) | 31(2.3) | 68(5.1) | 547(40.6) |
| Occupation not stated | 4,727 | 1,621(34.3) | 193(4.1) | 347(7.4) | 2,564(54.2) |
| Total | 527,509 | 161,965(30.7) | 24,563(4.6) | 35,688(6.8) | 305,293(57.9) |

Examining the results by occupation, the spread of percentages for those reporting wages and salary as their sole source of income ranges from 15.1% to 52.0%. The 52% value is an extreme one, applying to labourers not elsewhere classified. This would include odd job labourers who should have been classified as wage-earners. The next highest value is 42.4% for salesmen who receive a mixture of salaries and commission. Similarly the lowest value of 15.1% is an extreme one applying to professional and technical people. This is one of the more highly educated groups, and the census questionnaire is to some extent aimed at this group. The next lowest value is 31.1% and the median value is 34.3%.

After professional and technical people, the lowest values are for craftsmen, production process and related workers, and managerial occupations.

The lower values for craftsmen, production process and related workers can be explained to some degree by the fact that these are trained workers with special skills, such as shoemakers and jewellers, who would know and understand the meaning of the question. Furthermore this group would include members of strong unions such as plumbers and electricians, who would also have a better grasp of the meaning of the questions.

The better response from managerial occupations may be due to the inherent bias of the census towards this group of people. The questions might tend to be directed at this group, and thus they would be better able to answer them consistently.

After unclassified labourers, the highest values are obtained by sales occupation, and farmers and farm workers.

For sales occupations there is the possibility that a number of respondents entered their commissions and other income with wage and salary section of Form 4 despite the fact that they were operating their own business. Farmers and farm workers were instructed to exclude farm self-employment income and therefore only included wages from off the farm as earnings.

TABLE 4. Self-Employed by Industry by Response to Form 4

| | Total | 6 only | 6+7, 6LT7 | 6+7, 6GT7 | 7 only |
|--|---------|---------------|-------------|-------------|---------------|
| Agriculture | 25,495 | 9,813(38.5) | 2,598(6.5) | 1,615(6.3) | 12,413(48.7) |
| Forestry | 7,015 | 2,598(37.0) | 499(7.1) | 520(7.4) | 3,398(48.5) |
| Fishing and trapping | 30,509 | 10,175(33.3) | 3,685(12.1) | 1,949(6.4) | 14,700(48.2) |
| Mines, quarries and oil wells | 1,289 | 550(42.7) | 74(5.7) | 78(6.1) | 587(45.5) |
| Manufacturing | 41,278 | 15,505(37.5) | 1,477(3.6) | 2,473(6.0) | 21,823(52.9) |
| Construction | 71,925 | 25,449(35.5) | 2,794(3.9) | 5,050(7.0) | 38,582(53.6) |
| Transportation, communication and other utilities | 33,597 | 10,546(31.4) | 1,570(4.7) | 2,503(7.5) | 18,978(56.5) |
| Trade | 154,276 | 44,410(28.8) | 6,388(4.1) | 10,373(6.7) | 93,105(60.4) |
| Finance, insurance and real estate ... | 17,471 | 6,715(38.4) | 579(3.3) | 1,406(8.1) | 8,771(50.2) |
| Community, business and personal service | 138,258 | 33,984(24.6) | 5,582(4.0) | 9,245(6.7) | 89,447(64.7) |
| Public administration and defence | 113 | 63(55.8) | 5(4.4) | 19(16.8) | 26(23.0) |
| Unspecified or undefined | 6,333 | 2,157(34.1) | 256(4.0) | 457(7.2) | 3,463(54.7) |
| Total | 527,509 | 161,965(30.7) | 24,563(4.6) | 35,688(6.8) | 305,293(57.9) |

As for industries, the division with the highest percentage of those reporting wages and salary income was Public Administration and Defence, not surprising since self-employment is not possible in this industry. The next highest division is mines, quarries, and oil wells. Again this has a low number of people in the group. These seem to be concentrated in services to this industrial group, and they probably include people who contract themselves out to companies, and receive pay which they might record under wages and salaries. Agriculture also has a high percentage of inconsistency. The reason for this was explained above.

The industry groups with the lowest inconsistency were Community, Business and Personal Service Industries and Trade. As mentioned previously it has been suggested that the census is biased towards the members of these groups and that they can and do understand the concepts behind the questions better than people such as fishermen.

The general high level of entries indicating solely wage and salary income for those classified as self-employed may be due to the ambiguity of the classification both for status and for the way in which remuneration to self-employment is recorded. For example, although the respondent may indicate on Form 4 that income is paid in wages and salary, for the purposes of census definition this income frequently should be interpreted as net income from business.

Conclusion

For the wage and salary earner the response on Form 2A and Form 4 was quite compatible. The small differences that did occur could be explained by the lapse of time between some of the income data and the data concerning class of worker.

For the persons classified as self-employed the inconsistencies between the class of worker and income data were quite marked. The reasons for this are evident. The self-employed class included operators of own businesses, and this group of people would tend to report either some or all of their income to wages and salaries. Sales occupations may have tended to report their income to wages and salary as commissions were listed as examples of wages and salary.

Thus it was found that the self-employed had an inconsistency rate of much greater proportions than the wage earner, and there is a need to clarify both the dividing line between self-employed and wage earner and the method in which remuneration to the self-employed is recorded.

Appendix B

Distortion of 1961 Published Average Wages

Average earnings data from the 1961 Census 100% form (question 25) was distorted by a mistaken assignment of \$15,000 as a weight for the \$15,000+ class.

This fact is not directly connected with the consistency study, but since it reflects on the quality of 1961 earnings data it is covered in this appendix.

The table below lists all those occupations for which an appreciable distortion could be expected (defined as those occupations for which 10 or more wage-earners reported \$15,000). It shows the average earnings of wage-earners working 40-52 weeks, 35+ hours per week (in other words, full-time workers) as calculated using four different weights for the \$15,000 class.

It is generally accepted that a reasonable weight is something over \$20,000. An amount of \$23,500 was used for some purposes in 1961. The author has found from his study of professional engineers (Technical Memorandum No. 8 (General Series) DBS, Census Division, 1965) that \$28,000 may be closer. The proper weight, of course, must vary from occupation to occupation.

In reading this table, it should be remembered that the \$15,000 weight gives an amount equivalent to the 1961 published figures (although in fact data for full-time workers was not included in the main publishing program).

It is safe to assume that any occupation-and-sex category not in this table was not affected by this mistake.

Average Earnings by Occupation — Canada Wage-Earners

| Occupation | Weight given to \$15,000+ class | | | |
|------------------------------------|---------------------------------|----------|----------|----------|
| | \$15,000 | \$20,000 | \$25,000 | \$30,000 |
| | dollars | | | |
| Advertising Managers | M. 7,816 | 8,193 | 8,571 | 8,948 |
| Credit Managers | M. 5,713 | 5,743 | 5,773 | 5,802 |
| Sales Managers | M. 7,578 | 7,841 | 8,103 | 8,366 |
| Office Managers | M. 5,980 | 6,022 | 6,064 | 6,106 |
| Purchasing agents and buyers | M. 5,805 | 5,881 | 5,957 | 6,033 |
| Owners and Managers, n.e.s. in: | | | | |
| Forestry, logging | M. 7,308 | 7,539 | 7,770 | 8,002 |
| Mining, quarrying, oil wells | M. 9,407 | 10,215 | 11,024 | 11,832 |
| Food and beverage industries | M. 7,140 | 7,555 | 7,969 | 8,384 |
| Tobacco products industries | M. 9,168 | 10,075 | 10,981 | 11,888 |
| Rubber industries | M. 8,048 | 8,547 | 9,046 | 9,545 |

Average Earnings by Occupation -- Canada Wage-Earners -- Continued

| Occupation and Sex | | Weight given to \$15,000+ class | | | |
|---|----|---------------------------------|----------|----------|----------|
| | | \$15,000 | \$20,000 | \$25,000 | \$30,000 |
| | | dollars | | | |
| Owners and Managers, n.e.s. in | | | | | |
| — Concluded: | | | | | |
| Leather industries | M. | 7,850 | 8,449 | 9,047 | 9,646 |
| Textile industries | M. | 8,525 | 9,193 | 9,861 | 10,529 |
| Knitting mills | M. | 8,027 | 8,594 | 9,160 | 9,727 |
| Clothing industries | M. | 7,718 | 8,216 | 8,714 | 9,212 |
| Wood industries | M. | 7,110 | 7,393 | 7,675 | 7,958 |
| Furniture industries | M. | 7,200 | 7,569 | 7,937 | 8,306 |
| Paper and Allied industries | M. | 9,427 | 10,233 | 11,039 | 11,845 |
| Printing, publishing and allied industries | M. | 8,037 | 8,529 | 9,022 | 9,514 |
| Primary metal industries | M. | 9,363 | 10,158 | 10,953 | 11,748 |
| Metal fabricating industries | M. | 8,287 | 8,788 | 9,289 | 9,790 |
| Machinery industries (ex. electrical misc.) | M. | 8,548 | 9,142 | 9,736 | 10,330 |
| Transportation equipment industries | M. | 8,721 | 9,295 | 9,868 | 10,442 |
| Electrical Products industries | M. | 8,623 | 9,164 | 9,705 | 10,246 |
| Non-metallic mineral products industries | M. | 7,769 | 8,214 | 8,658 | 9,103 |
| Petroleum and coal products industries ... | M. | 8,763 | 9,421 | 10,080 | 10,738 |
| Chemical and chemical products industries | M. | 9,069 | 9,804 | 10,540 | 11,275 |
| Miscellaneous Manuf. industries | M. | 7,997 | 8,502 | 9,007 | 9,511 |
| Construction Industry | M. | 7,426 | 7,711 | 7,995 | 8,280 |
| Transportation, comm. & other utilities .. | M. | 7,139 | 7,372 | 7,605 | 7,838 |
| Wholesale trade | M. | 7,015 | 7,344 | 7,674 | 8,003 |
| Retail trade | M. | 5,557 | 5,691 | 5,825 | 5,959 |
| Finance, Insurance | M. | 7,580 | 7,939 | 8,298 | 8,657 |
| Education and related services | M. | 7,008 | 7,334 | 7,660 | 7,986 |
| Health and Welfare services | M. | 6,460 | 6,666 | 6,871 | 7,077 |
| Motion picture and rec. services | M. | 5,350 | 5,480 | 5,610 | 5,740 |
| Service to business management | M. | 8,825 | 9,547 | 10,270 | 10,992 |
| Personal services | M. | 4,585 | 4,946 | 5,033 | 5,121 |
| Miscellaneous service | M. | 6,455 | 6,598 | 6,740 | 6,883 |
| Fed. administration (in other Gov't) | M. | 6,316 | 6,433 | 6,550 | 6,667 |
| Provincial administration | M. | 6,378 | 6,485 | 6,591 | 6,698 |
| Local administration | M. | 5,425 | 5,471 | 5,516 | 5,562 |
| All other industries (inc. unspecified) .. | M. | 6,257 | 6,476 | 6,695 | 6,914 |
| | | | | | |
| Civil engineers | M. | 7,621 | 7,739 | 7,856 | 7,974 |
| Mechanical engineers | M. | 7,407 | 7,498 | 7,589 | 7,680 |
| Industrial engineers | M. | 7,106 | 7,213 | 7,321 | 7,428 |
| Electrical engineers | M. | 7,706 | 7,786 | 7,866 | 7,946 |
| Mining engineers | M. | 8,115 | 8,359 | 8,604 | 8,848 |
| Chemical engineers | M. | 8,032 | 8,205 | 8,379 | 8,552 |

Average Earnings by Occupation — Canada Wage-Earners — Continued

| Occupation and Sex | Weight given to \$15,000+ class | | | |
|---|---------------------------------|----------|----------|----------|
| | \$15,000 | \$20,000 | \$25,000 | \$30,000 |
| | dollars | | | |
| Professional engineers | M. 7,697 | 7,837 | 7,978 | 8,118 |
| Chemists | M. 6,629 | 6,687 | 6,746 | 6,804 |
| Geologists | M. 8,165 | 8,328 | 8,490 | 8,653 |
| Physicists | M. 8,252 | 8,368 | 8,484 | 8,600 |
| Physical scientists | M. 7,832 | 7,977 | 8,122 | 8,267 |
| Professors and college principals | M. 7,487 | 7,676 | 7,865 | 8,053 |
| School teachers | M. 5,928 | 5,938 | 5,947 | 5,957 |
| Physicians and surgeons | M. 7,472 | 8,157 | 8,842 | 9,528 |
| | F. 5,132 | 5,259 | 5,386 | 5,513 |
| Dentists | M. 8,268 | 8,520 | 8,773 | 9,025 |
| Judges and Magistrates | M. 10,817 | 12,269 | 13,722 | 15,174 |
| Lawyers and notaries | M. 7,905 | 8,331 | 8,756 | 9,182 |
| Artists, commercial | M. 5,347 | 5,392 | 5,437 | 5,483 |
| Authors, editors and journalists | M. 6,231 | 6,325 | 6,419 | 6,512 |
| Musicians and music teachers | M. 5,437 | 5,524 | 5,611 | 5,698 |
| Architects | M. 7,268 | 7,396 | 7,524 | 7,652 |
| Actuaries and statisticians | M. 6,629 | 6,817 | 7,005 | 7,194 |
| Economists | M. 7,315 | 7,470 | 7,624 | 7,779 |
| Accountants and auditors | M. 6,304 | 6,365 | 6,425 | 6,486 |
| Science and engineering technicians n.e.s. | M. 4,817 | 4,821 | 4,825 | 4,829 |
| Professional occupations n.e.s. | M. 5,917 | 5,959 | 6,001 | 6,043 |
| Stenographers | M. 4,330 | 4,369 | 4,408 | 4,448 |
| Clerical occupations, n.e.s. | M. 3,801 | 3,802 | 3,802 | 3,803 |
| Foremen, trade | M. 4,755 | 4,764 | 4,774 | 4,783 |
| Canvassers and other door-to-door salesmen | M. 4,379 | 4,392 | 4,405 | 4,418 |
| Commercial travellers | M. 5,523 | 5,565 | 5,607 | 5,649 |
| Sales clerks | M. 3,462 | 3,465 | 3,468 | 3,470 |
| Advertising salesmen and agents | M. 5,596 | 5,654 | 5,713 | 5,771 |
| Insurance salesmen and agents | M. 5,538 | 5,603 | 5,667 | 5,732 |
| Real Estate salesmen and agents | M. 5,043 | 5,103 | 5,164 | 5,224 |
| Security salesmen and brokers | M. 6,225 | 6,425 | 6,625 | 6,825 |
| Brokers agents and appraisers, n.e.s. | M. 5,291 | 5,314 | 5,337 | 5,360 |

